

# MATERIAL SAFETY DATA SHEET

## I. MATERIAL IDENTIFICATION

Manufacturer's Name: Various  
 Address: Cooper Alloy Metals, L.P.  
 Hillside, NJ 07205 - as Distributor  
 Material Name: Nickel Scrap & Nickel Alloys

Telephone Number: (201) 688-4120

## II. HAZARDOUS INGREDIENTS

|            | CAS Number  | $\frac{g}{m^3}$ |                  | OSHA<br>8-hr TWA                               | ACGIH<br>8-hr TWA<br>(1984-85)  | ACGIH<br>STEL<br>(1984-85) |
|------------|-------------|-----------------|------------------|--|---|----------------------------|
| Nickel     | (7440-02-0) | $\geq 34$       |                  | 1 mg/m <sup>3</sup>                            | 1 mg/m <sup>3</sup>   | --                         |
| Iron       | (1309-37-1) | $< 37$          |                  | 10 mg/m <sup>3</sup>                           | 5 mg/m <sup>3</sup><br>(as iron oxide fume)                                 | 10 mg/m <sup>3</sup>       |
| Copper     | (7440-50-8) | $\leq 33$       | (Dust)<br>(Fume) | 1 mg/m <sup>3</sup><br>0.1 mg/m <sup>3</sup>   | 1 mg/m <sup>3</sup><br>0.2 mg/m <sup>3</sup>                                | 2 mg/m <sup>3</sup><br>--  |
| Molybdenum | (7439-98-7) | $\leq 33$       |                  | 15 mg/m <sup>3</sup>                           | 10 mg/m <sup>3</sup>  | 20 mg/m <sup>3</sup>       |
| Chromium   | (7440-47-3) | $\leq 28$       |                  | 1 mg/m <sup>3</sup>                            | 0.5 mg/m <sup>3</sup>   | --                         |
| Tungsten   | (7440-33-7) | $\leq 20$       |                  | --   | 5 mg/m <sup>3</sup><br>(insoluble)  | 10 mg/m <sup>3</sup>       |
| Cobalt     | (7440-48-4) | $\leq 19$       |                  | 0.1 mg/m <sup>3</sup>                          | 0.1 mg/m <sup>3</sup>   | --                         |
| Silicon    | (7440-21-3) | $\leq 10$       |                  | (1)  | (2)   | 20 mg/m <sup>3</sup>       |
| Tantalum   | (7440-25-7) | $\leq 9$        |                  | 5 mg/m <sup>3</sup>                            | 5 mg/m <sup>3</sup>   | 10 mg/m <sup>3</sup>       |
| Aluminum   | (7429-90-5) | $\leq 8$        | (Dust)<br>(Fume) | --<br>--                                       | 10 mg/m <sup>3</sup><br>5 mg/m <sup>3</sup>                                 | 20 mg/m <sup>3</sup><br>-- |
| Niobium    |             | $< 6$           |                  | --   | --  | --                         |
| Titanium   | (7440-32-6) | $< 6$           |                  | --   | (2)<br>(as titanium dioxide)  | 20 mg/m <sup>3</sup>       |
| Hafnium    | (7440-58-6) | $< 2$           |                  | 0.5 mg/m <sup>3</sup>                          | 0.5 mg/m <sup>3</sup>   | 1.5 mg/m <sup>3</sup>      |
| Manganese  | (7439-96-5) | $< 2$           | (Dust)<br>(Fume) | 5 mg/m <sup>3</sup><br>--                      | 5 mg/m <sup>3</sup><br>1 mg/m <sup>3</sup>                                  | --<br>3 mg/m <sup>3</sup>  |
| Zirconium  | (7440-67-2) | $< 2$           |                  | 5 mg/m <sup>3</sup>                            | 5 mg/m <sup>3</sup>   | 10 mg/m <sup>3</sup>       |
| Carbon     | (1333-86-4) | $\leq 1$        |                  | 3.5 mg/m <sup>3</sup>                          | 1.5 mg/m <sup>3</sup><br>(as carbon black)                                  | 7 mg/m <sup>3</sup>        |
| Vanadium   | (1314-62-1) | $\leq 1$        | (Dust)<br>(Fume) | 0.5 mg/m <sup>3</sup><br>0.1 mg/m <sup>3</sup> | 0.05 mg/m <sup>3</sup><br>0.05 mg/m <sup>3</sup><br>(as vanadium pentoxide) | --<br>--                   |

### \* Ceiling Limit

- (1)  $< 14$  quartz, 15 mg/m<sup>3</sup> of total dust or 5 mg/m<sup>3</sup> respirable dust.  
 (2)  $< 14$  quartz, 10 mg/m<sup>3</sup> of total dust or 5 mg/m<sup>3</sup> respirable dust.

Note: chromium, cobalt-chromium alloy, and nickel have been identified as potential human carcinogens. See Section VI. Health Hazard Data.



## III. PHYSICAL DATA

Melting Point (of nickel): 1455° C  
 Specific Gravity: 7.8 - 9.24  
 Boiling Point (of nickel): 2730° C

Vapor Pressure: 1 mm Hg @ 1810° C  
 (of nickel)  
 Solubility in water: insoluble

Appearance: dependent on composition of scrap metal, processing method used, and existing protective coatings.

## IV. FIRE AND EXPLOSION DATA

Flash Point: information not available  
 Autoignition Temperature: information not available

Flammability Limits: information not available

Solid, massive form of material is not combustible under ordinary fire conditions. Fire and explosion hazards are moderate when material is in the form of dust and exposed to heat or flames, chemical reaction, or contact with powerful oxidizers. Fires have been reported in piles of fine scrap, possibly due to contamination from oil or other materials which support combustion. Powdered chromium, hafnium, and tantalum may explode spontaneously in air.

Fire Extinguishing Methods: Use special mixtures of dry chemical, or sand. Fire fighters should wear self-contained breathing apparatus and protective clothing.

## V. REACTIVITY DATA

Massive material is stable at ordinary temperatures, but dust presents moderate fire and explosion hazards. Material may be incompatible with acids, bases, and oxidizers. Copper reacts violently with acetylene. Molten scrap metal may react violently with water. For additional information, users should consult data sheets on individual component elements.

## VI. HEALTH HAZARD DATA

TLV: see Section II.

Primary Routes of Entry: inhalation of dust or fume.

Under normal handling and use, exposure to the massive form of nickel scrap presents few health hazards in itself. Thermal cutting and melting of scrap may produce fumes containing the component elements, and breathing these fumes may present potentially significant health hazards. Overexposure to dusts and especially fumes containing component elements of nickel alloys may cause skin, nose, mouth, and eye irritation and lung changes in workers, potentially leading to pulmonary diseases. The exposure levels in Section II are relevant to fumes and dusts. Special precautions should be taken if scrap is contaminated; see Section IX.

Nickel compounds and chromium have been associated with allergic reactions and rashes, and lung changes. Nickel is a respiratory irritant and can cause pneumonitis.

Cobalt is irritating to the eyes and skin and can cause an allergic dermatitis, especially in combination with nickel and chromium.

Fumes of copper and manganese may cause metal fume fever with flu-like symptoms. Copper may cause skin and hair discoloration. Overexposure to manganese fumes can cause chronic manganese poisoning. Early symptoms include headaches, apathy, sleepiness, and weakness or cramps in the legs. Chronic overexposure can affect the central nervous system, ultimately leading to emotional disturbances, gait and balance difficulties, and paralysis.

Chromium, cobalt-chromium alloy, and nickel have been identified as potential cancer-causing agents.

## FIRST AID:

|               |  |
|---------------|--|
| Eye Contact:  | Flush well with running water to remove particulate. Get medical attention.  |
| Skin Contact: | Brush off excess dust. Wash area well with soap and water.   |
| Inhalation:   | Remove to fresh air. Get medical attention.  |
| Ingestion:    | Seek medical help if large quantities of material have been ingested. (Ingestion of significant amounts of scrap metal is unlikely.) |

#### VII. SPILL PROCEDURES

No special precautions are necessary for spills of bulk material. If large quantities of dust are spilled, remove by vacuuming or wet sweeping to prevent heavy concentrations of airborne dust. Clean-up personnel should wear respirators and protective clothing.

Scrap metal can be reclaimed for reuse. Follow Federal, State, and Local regulations regarding disposal.

#### VIII. SPECIAL PROTECTION INFORMATION

Use general and local exhaust ventilation to keep airborne concentrations of dust or fume below the TLV. Employees should wear MSHA or NIOSH approved respirators for protection against airborne dust or fumes. Full protective clothing should be worn by workers exposed to heavy concentrations of dust, and showering should be required before changing into street clothes. Gloves and barrier creams may be necessary to prevent skin sensitization and dermatitis.

Approved safety glasses or goggles should be worn when working with dusty material. Safety eyewash stations should be provided in close proximity to work areas.

Pre-employment and periodic medical evaluations should be provided. Attention should be directed toward skin, eyes, respiratory tract, blood, kidneys, pulmonary function, and neurologic health. Chest x-rays should be included if symptoms are present.

Food should not be consumed in the work area.

Special precautions should be taken if scrap is contaminated: see Section IX.

#### IX. SPECIAL PRECAUTIONS

Use good housekeeping practices to prevent accumulations of dust and to keep airborne dust concentrations at a minimum. Avoid breathing dusts or fumes.

Store material away from incompatible materials, and keep dust away from sources of ignition.

This material is potentially contaminated with coatings, paints, preservatives, cutting oils, and other contaminants. If the material is contaminated, special precautions (such as process control and personal protective equipment, appropriate to the nature of the suspected contaminants) should be taken to avoid resulting exposures when handling, cutting (mechanical or thermal), and/or melting.

Prepared by: Institute of Scrap Iron and Steel (ISIS)  
in consultation with JMS Associates

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